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THE
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PHILOSOPHICAL JOURNAL,

EXHIBITING A VIEW OF
THE PROGRESS OF DISCOVERY IN NATURAL PHILOSOPHY,
CHEMISTRY, NATURAL HISTORY, PRACTICAL MECHANICS,
GEOGRAPHY, STATISTICS, AND THE FINE AND USEFUL
ARTS,

FOR

JUNE......OCTOBER 1819.

CONDUCTED BY

DR BREWSTER AND PROFESSOR JAMESON.

TO BE CONTINUED QUARTERLY.

VOL. I.

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scepticism which discredits every thing that it cannot understand, than the circumstance that this work should have produced so little effect, and that the numerous falls of meteoric stones should have so long been ranked among the inventions of ignorant credulity.

CHAP. I.—CHRONOLOGICAL LIST OF METEORIC STONES.

SECT. 1.—*Before the Christian Æra.*

Division I.—Containing those which can be pretty nearly referred to a date.

A. C.

1478. The thunderstone in Crete, mentioned by Malchus, and regarded probably as the symbol of Cybele.—*Chronicle of Paros*, l. 18, 19.

1 [illegible]1. Shower of stones which destroyed the enemies of Joshua [illegible] Beth-horon.—*Joshua*, chap. x. v. 11 *.

1200. Stones preserved at Orchomenos.—*Pausanias.*

1168. A mass of iron upon Mount Ida in Crete.—*Chronicle of Paros*, l. 22.

705 or 704. The *Ancyle* or sacred shield, which fell in the reign of Numa. It had nearly the same shape as those which fell at the Cape and at Agram.—*Plutarch, in Num.*

654. Stones which fell upon Mount Alba, in the reign of Tullus Hostilius.—"Crebri cecidere cœlo lapides."—*Liv.* 1. 31.

644. Five Stones which fell in China, in the country of Song.—*De Guignes.*

466. A large stone at Ægospotamos, which Anaxagoras supposed to come from the sun. It was as large as a cart, and of a burnt colour. "Qui lapis etiam nunc ostenditur, magnitudine vehis, colore adusto."—*Plutarch, Pliny*, lib. ii. cap. 58.

465. A stone near Thebes.—*Scholiast of Pindar.*

461. A stone fell in the marsh of Ancona. *Valerius Maximus, Liv.* lib. 7. cap. 28.

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* The word אבנים *abenim*, which according to Parkhurst, signifies stones in general, has been translated, without any reason, *hailstones*, in our version of the Bible. In the Book of Job, however, ch. 28. v. 3., the same word is translated *stones of darkness*, meaning, says Scott, "undoubtedly metallic stones or metals which man searches out." Miss Smith, in her Translation of Job, attaches the very same meaning to the word.

343. A shower of stones fell near Rome.—*Jul. Obsequens.*

211. Stones fell in China, along with a falling star.—*De Guignes, &c.*

205 or 206. Fiery Stones.—*Plutarch, Fab. Max.* cap. 2.

192. Stone fell in China.—*De Guignes.*

176. A stone fell in the lake of Mars.—"*Lapidem in agro Crustumino in Lacum Martis de cœlo cecidisse.*" Liv. xli. 8.

90 or 89. *Eodem causam dicente, lateribus coctis pluisse, in ejus anni acta relatum est. Plin. Nat. Hist.*, lib. ii. cap. 56.

89. Two large stones fell at Yong in China. The sound was heard over forty leagues. *De Guignes.*

56 or 52. Spongy iron fell in Lucania. *Plin.*

46. Stones fell at Acilla. *Cæsar.*

38. Six stones fell in Leang in China.—*De Guignes.*

29. Four stones fell at Po in China.—*De Guignes.*

22. Eight stones fell from heaven, in China.—*De Guignes.*

12. A stone fell at Ton-Kouan.—*De Guignes.*

9. Two stones fell in China.—*De Guignes.*

6. Sixteen stones fell in Ning-Tcheon, and other two in the same year.—*De Guignes.*

Division II.—Containing those, of which the date cannot be determined.

The Mother of the Gods, which fell at Pessinus.

The stone preserved at Abydos.—*Plin.*

The stone preserved at Cassandria.—*Plin.*

The Black Stone, and also another preserved in the Caaba of Mecca.

The "Thunderbolt, black in appearance like a hard rock, brilliant and sparkling," of which the blacksmith forged the sword of Antar.—See *Quarterly Review*, vol. xxi. p. 225. and *Antar*, translated by T. Hamilton, Esq. p. 152.

Perhaps the stone preserved in the Coronation Chair of the Kings of England.

P. C.

Sect. II.—*After the Christian Æra.*

A stone in the country of the Vocontini.—*Plin.*

452. Three large stones fell in Thrace.—*Cedrenus* and *Marcellini, Chronicon*, p. 29. "Hoc tempore," says Marcellinus, "tres magni lapides e cœlo in Thracia ceciderunt."

Sixth Century.—Stones fell upon Mount Lebanon and near Emisa in Syria.—*Damascius.*

About 570. Stones near Bender in Arabia.—*Alkoran*, vi. 16., and cv. 3. and 4.

648. A fiery stone at Constantinople.—*Several Chronicles.*

823. A shower of pebbles in Saxony.

852. A stone fell in Tabaristan, in July or August.—*De Sacy* and *Quatremere.*

897. A stone fell at Ahmedabad.—*Quatremere.* In 892, according to the *Chron. Syr.*

951. A stone fell near Augsburg.—*Alb. Stad* and others.

998. Two stones fell, one near the Elbe, and the other in the town of Magdeburg.—*Cosmas* and *Spangenberg.*

1009. A mass of iron fell in Djordjan.—*Avicenna.*

1021. Stones fell in Africa between the 24th July and the 21st of August.—*De Sacy.*

1112. Stones or iron fell near Aquileja.—*Valvasor.*

1135 or 1136. A stone fell at Oldisleben, in Thuringia.—*Spangenberg* and others.

1164. During Pentecost iron fell in Misnia.—*Fabricius.*

1198. A stone fell near Paris.

1249. Stones fell at Quedlinbourg, Ballenstadt and Blankenburg, on the 26th July.—*Spangenberg* and *Rivander.*

Thirteenth Century.—A stone fell at Wurzburg.—*Schottus, Phys. Cur.*

Between 1251 and 1363. Stones fell at Welixoi-Ussing in Russia.—*Gilbert's Annal.* tom. 35.

1280. A stone fell at Alexandria in Egypt.—*De Sacy.*

1304. Oct. 1. Stones fell at Friedland or Friedberg.—*Kranz* and *Spangenberg.*

1305. Stones fell in the country of the Vandals.

1328, Jan. 9. In Mortahiah and Dakhaliah.—*Quatremere.*

1368. A mass of iron in the Duchy of Oldenburg.—*Siebrand, Meyer.*

1379, May 26. Stones fell at Minden in Hanover.—*Lerbecius.*

1438. A shower of spongy stones at Roa, near Burgos in Spain.—*Proust.*

A stone fell near Lucerne.—*Cysat.*

1491, March 22. A stone fell near Crema.—*Simoneta.*

1492, Nov. 7. A stone of 260 lb. fell at Ensisheim near Sturgau, in Alsace. It is now in the library of Colmar, and has been reduced to 150 lb.—Trithemius, *Hirsaug. Annal.*, Conrad Gesner, *Liber de Rerum fossilium Figuris, cap.* 3. *p.* 66. in his *Opera, Zurich* 1565.

1496, Jan. 26. or 28. Three stones fell between Cesena and Bertonori.—*Buriel* and *Sabellicus.*

1510. About 1200 stones, one of which weighed 120 lb. and and others 60 lb. fell in a field near the river Abdua. "Color ferrugineus, durities eximia, odor sulphureus."—Surius, *Comment.*, Cardan, *De rerum Varietate*, lib. xiv. c. 72.

1511, Sept. 4. Several stones, some of which weighed 11 lb. and others 8 lb. fell at Crema.—*Giovanni del Prato*, and others.

1520, May. Stones fell in Arragon.—*Diego de Sayas.*

1540, April 28. A stone fell in the Limousin.—*Bonav. de St Amable.*

Between 1540 and 1550. A mass of iron fell in the forest of Naunhoff.—*Chronicle of the Mines of Misnia.*

—— Iron fell in Piedmont.—*Mercati* and *Scaliger.*

1548, Nov. 6. A black mass fell at Mansfeld in Thuringia.—*Bonav. de St Amable.*

1552, May 19. Stones fell in Thuringia near Schlossingen.—*Spangenberg.*

1559. Two large stones, as large as a man's head, fell at Miscolz in Hungary, which are said to be preserved in the Treasury at Vienna.—*Sthuansi.*

1561, May 17. A stone, called the *Arx Julia*, fell at Torgau and Eilenborg.—*Gesner* and *De Boot.*

1580, May 27. Stones fell near Gottingen.—*Bange.*

1581, July 26. A stone, 39 lb. weight, fell in Thuringia. It was so hot that no person could touch it. *Binhard, Olearius.*

1583, Jan. 9. Stones fell at Castrovillari. *Casto, Mercati,* and *Imperati.*

—— in the Ides of Jan. A stone of 30 lb. resembling iron, fell at Rosa in Lavadie.

—— March 2. A stone fell in Piedmont of the size of a granade.

1591, June 19. Some large stones fell at Kunersdorf.—*Lucas.*

1596, March 1. Stones fell at Crevalcose.—*Mittarelli.*

In the 16th century, not in 1603. A stone fell in the kingdom of Valencia.—*Cæsius* and the *Jesuits of Coimbra.*

1618, August. A great fall of stones took place in Styria.—*Stammes.*

—— A metallic mass fell in Bohemia.—*Kronland.*

1621, April 17. A mass of iron fell about 100 miles S. E. of Lahore.—*Jehan Guir's Memoirs.*

1622, Jan. 10. A stone fell in Devonshire.—*Rumph.*

1628, April 9. Stones fell near Hatford in Berkshire; one of them weighed 24 lb.—*Gent. Mag.* Dec. 1796.

1634, Oct. 27. Stones fell in Charollois.—*Morinus.*

1635, June 21. A stone fell at Vago in Italy.

—— July 7, or Sept. 29. A stone, weighing about 11 oz. fell at Calce.—*Valisnieri*, Opere, vi. 64.

1636, March 6. A burnt looking stone fell between Sagan and Dubrow in Silesia.—*Lucas* and *Cluverius.*

1637, Nov. 29. Gassendi says a stone, of a black metallic colour, fell on Mount Vaision, between Guilliaume and Perne in Provence. It weighed 54 lb. and had the size and shape of the human head. Its specific gravity was 3.5.—*Gassendi, Opera*, p. 96, Lyons, 1658.

1642, August 4. A stone, weighing 4 lb. fell between Woodbridge and Aldborough in Suffolk.—*Gent. Mag.* Dec. 1796.

1643, or 1644. Stones fell in the sea.—*Wuofbrain.*

1647, Feb. 18. A stone fell near Fwicxau.—*Schmid.*

—— August. Stones fell in the bailliage of Stolzenem in Westphalia.—*Gilbert's Annal.*

Between 1647 and 1654, A mass fell in the sea.—*Willman.*

1650, August 6. A stone fell at Dordrecht.—*Senguesd.*

1654, March 30. Stones fell in the Island of Funen.—*Bartholinus.*

A large stone fell at Warsaw.—*Petr. Borellus.*

A small stone fell at Milan, and killed a Franciscan.—*Museum Septalianum.*

1668, June 19. or 21. Two stones, one 300 lb. and the other 200 lb. weight, fell near Verona.—Legallois, *Conversations*, &c. Paris 1672, Valisnieri, *Opere*, ii. p. 64. 66., *Montanan* and *Francisco Carli*, who published a letter, containing several curious notices respecting the fall of stones from the heavens.

1671, Feb. 27. Stones fell in Suabia.—*Gilbert's Ann.* tom. xxxiii.

1673. A stone fell in the fields near Dietling. "Nostris temporibus in partibus Galliæ Cispadanæ, lapis magnæ quantitatis e nubibus cecidit."—See Leonardus, *de Gemmis*, lib. i. cap. 5., and *Memorie della Societa Colombaria Fiorentina*, 1747, vol. i. diss. vi. p. 14.

1674, Oct. 6. Two large stones fell near Glaris.—*Scheuchzer*.

Between 1675 and 1677. A stone fell into a fishing-boat near Copinshaw.—Wallace's *Account of Orkney*, and *Gent. Mag.* July 1806.

1677, May 28. Several stones, which probably contained copper, fell at Ermundorf near Roosenhaven.—Misi, *Nat. Cur.* 1677. App.

1680, May 18. Stones fell at London.—*King*.

1697, Jan. 13. Stones fell at Pentolina near Sienna.—*Soldani* after *Gabrieli*.

1698, May 19. A stone fell at Walhing.—*Scheuchzer*.

1706, June 7. A stone of 72 lb. fell at Larissa in Macedonia. It smelled of sulphur, and was like the scum of iron.—*Paul Lucas*.

1722, June 5. Stones fell near Scheftlas in Freisingen.—*Meichelbeck*.

1723, June 22. About thirty-three stones, black and metallic, fell near Plestowitz in Bohemia.—*Rost* and *Stepling*.

1727, July 22. Stones fell at Lilaschitz in Bohemia.—*Stepling*.

1738, August 18. Stones fell near Carpentras.—*Castillon*.

1740, Oct. 25. Stones fell at Rasgrad.—*Gilbert's Annal.* tom. L.

—— to 1741. A large stone fell in winter in Greenland.—*Egede*.

1743. Stones fell at Liboschitz in Bohemia.—*Stepling*.

1750, Oct. 1. A large stone fell at Niort near Coutance.—*Huard* and *Lalande*.

1751, May 26. Two masses of iron of 71 lb. and 16 lb. fell in the district of Agram, the capital of Croatia. The largest of these is now in Vienna.

1753, Jan. A stone fell in Germany, in Eichstadt.—*Cavallo*, iv. 377.

—— July 3. Four stones, one of which weighed 13 lb. fell at Strkow, near Tabor.—*Stepling*, "*De Pluvia lapidea, anni* 1753 *ad Strkow, et ejus causis, meditatio*," p. 4. Prag. 1754.

—— Sept. Two stones, one of 20 lb. and the other of 11 lb. fell near the villages of Liponas and Pin in Brene.—*Lalande* and *Richard*.

1755, July. A stone fell in Calabria, at Terranuova, which weighed 7 lb. 7½ oz.—*Domin. Tata.*

1766, end of July. A stone fell at Albereto in Modena.—*Troili.*

—— August 15. A stone fell at Novellara.—*Troili.*

1768, Sept. 13. A stone fell near Luce in Maine. It was analyzed by Lavoisier, &c. *Mem. Acad. Par.*

A stone fell at Aire.—*Mem. Acad. Par.*

1768, Nov. 20. A stone, weighing 38 lb., fell at Mauerkirchen in Bavaria.—*Imhof.*

1773, Nov. 17. A stone, weighing 9 lb. 1 oz., fell at Sena in Arragon.—*Proust.*

1775, Sept. 19. Stones fell near Rodach in Cobourg.—*Gilbert's Annal.* tom. xxiii.

—— or 1776. Stones fell at Obruteza in Volhynia.—*Gilbert's Annal.* tom. xxxi.

1776 or 1777, Jan. or Feb. Stones fell near Fabriano.—*Soldani* and *Amoretti.*

1779. Two stones, weighing 3½ oz. each, fell at Pettiswoode in Ireland.—*Bingley*, in *Gent. Mag.* Sept. 1796.

1780, April 1. Stones fell near Beeston in England.—*Evening Post.*

1782. A stone fell near Turin.—*Tata* and *Amoretti.*

1785, Feb. 19. Stones fell at Eichstadt.—*Pickel* and *Stulz.*

1787, Oct. 1. Stones fell in the province of Charkow in Russia. —*Gilbert's Annal.* tom. xxxi.

1790, July 24. A great shower of stones fell at Barbotan near Roquefort, in the vicinity of Bourdeaux. A mass, 15 inches in diameter, penetrated a hut, and killed a herdsman and a bullock. Some of the stones weighed 25 lb. and others 30 lb.—*Lomet.*

1791, May 17. Stones fell at Cassel-Berardenga, in Tuscany.—*Soldani.*

1794, June 16. Twelve stones, one of which weighed 7½ oz. fell at Sienna. Howard and Klaproth have analysed these stones. —*Phil. Trans.* 1794, p. 103.

1795, April 13. Stones fell at Ceylon.—*Beck.*

—— Dec. 13. A large stone, weighing 55 lb., fell near Wood Cottage in Yorkshire. No light accompanied the fall.—*Gentleman's Mag.* 1796.

1796, Jan. 4. Stones fell near Belaja-Ferkwa in Russia.—*Gilbert's Annal.* tom. xxxv.

—— Feb. 19. A stone of 10 lb. fell in Portugal.—Southey's *Letters from Spain.*

1798, March 8. or 12. Stones, one of which was the size of a calf's head, fell at Sales.—*Marquis de Drée.*

—— Dec. 19. Stones fell in Bengal.—*Howard, Lord Valentia.*

1799, April 5. Stones fell at Batanrouge on the Mississippi.—*Belfast Chronicle of the War.*

1801. Stones fell on the Island of Tonneliers.—*Bory de St Vincent.*

1802, Sept. Stones fell in Scotland.—*Monthly Magazine*, Oct. 1802 *.

1803, April 26. A great fall of stones took place at Aigle. They were about three thousand in number, and the largest weighed about 17 lb.

—— Oct. 5. Stones fell near Avignon.—*Bibl. Brit.*

—— Dec. 13. A stone fell near Eggenfelde in Bavaria, weighing 3½ lb.—*Imhof.*

1804, April 5. A stone fell at Possil, near Glasgow.

——, 1807. A stone fell at Dordrecht.—*Van Beek Calkoen.*

1805, March 25. Stones fell at Doroninsk in Siberia.—*Gilbert's Annal.* tom. xxix. and xxxi.

—— June. Stones, covered with a black crust, fell in Constantinople.

1806, March 15. Two stones fell at St Etienne and Valance; one of them weighed 8 lb.

—— May 17. A stone weighing 2½ lb. fell near Basingstoke in Hampshire.—*Monthly Magazine.*

1807, March 13. (June 17. according to Lucas,) A stone of 160 lb. fell at Fimochin, in the province of Smolensko in Russia.—*Gilbert's Annal.*

—— Dec. 14. A great shower of stones fell near Weston in Connecticut. Masses of 20 lb. 25 lb. and 35 lb. were found.—*Silliman* and *Kingsley.*

1808, April 19. Stones fell at Borgo San-Donino.—*Guidotti* and *Spagnoni.*

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* We have inserted this notice from Chladni, though we believe that no stones fell in Scotland at the time here mentioned.

1808, May 22. Stones weighing 4 lb. or 5 lb. fell near Stannern in Moravia.—*Bibl. Brit.*

—— Sept. 3. Stones fell at Lissa in Bohemia.—*De Schreibers.*

1809, June 17. A stone of 6 oz. fell on board an American vessel in latitude 30° 58′ N., and longitude 70° 25′ W.—*Bibl. Brit.*

1810, Jan. 30. Stones, some of which weighed about 2 lb. fell in Caswell county, North America.—*Phil. Mag.* vol. xxxvi.

—— July. A great stone fell at Shahabad in India. It burned five villages, and killed several men and women.—*Phil. Mag.* xxxvii. p. 236.

—— Aug. 10. A stone weighing 7¾ lb. fell in the county of Tipperary in Ireland.—*Phil. Mag.* vol. xxxviii.

—— Nov. 23. Stones fell at Mortelle, Villerai, and Moulinbrulé, in the department of the Loiret; one of them weighed 40 lb., and the other 20 lb.—*Nich. Journal,* vol. xxxix. p. 158.

1811, March 12. or 13. A stone of 15 lb. fell in the village of Konglinhowsh, near Romea in Russia.—Bruce's *American Journal,* No. 3.

—— July 8. Stones, one of which weighed 3¼ oz., fell near Balanguillas in Spain.—*Bibl. Brit.* tom. xlviii. p. 162.

1812, April 10. A shower of stones fell near Thoulouse.

—— April 15. A stone, the size of a child's head, fell at Erxleben. A specimen of it is in the possession of Professor Haussman of Brunswick.—*Gilbert's Annal.* xl. and xli.

—— Aug. 5. Stones fell at Chantonay.—*Brochant.*

1813, March 14. Stones fell at Cutro in Calabria, during a great fall of red dust.—*Bibl. Brit.* Oct. 1813.

—— Sept. 9. and 10. Several stones, one of which weighed 17 lb. fell near Limerick in Ireland.—*Phil. Mag.*

1814, Feb. 3. A stone fell near Bacharut in Russia.—*Gilbert's Annal.* tom. L.

—— Sept. 5. Stones, some of which weighed 18 lb. fell in the vicinity of Agen.—*Phil. Mag.* vol. xlv.

—— Nov. 5. Stones, of which nineteen were found, fell in the Doab in India.—*Phil. Mag.*

1815, Oct. 3. A large stone fell at Chassigny near Langres.—*Pistollet.*

1816. A stone fell at Glastonbury in Somersetshire.—*Phil. Mag.*

1817, May 2. and 3. There is reason to think, that masses of stone fell in the Baltic after the great meteor of Gottenburg. —*Chladni.*

1818, Feb. 15. A great stone appears to have fallen at Limoge, but it has not been disinterred.—*Gazette de France*, Feb. 25. 1818.

—— July 29. O. S. A stone of 7 lb. fell at the village of Slobodka in Smolensko. It penetrated nearly sixteen inches into the ground. It had a brown crust with metallic spots.

CHAP. II.—LIST OF MASSES OF IRON SUPPOSED TO HAVE FALLEN FROM THE HEAVENS.

SECT. I.—*Spongy or Cellular Masses containing Nickel.*

1. The mass found by Pallas in Siberia, to which the Tartars ascribe a meteoric origin.—*Voyages de Pallas*, tom. iv. p. 545. *Paris* 1793.
2. A fragment found between Eibenstock and Johanngeorgenstadt.
3. A fragment probably from Norway, and in the imperial cabinet of Vienna.
4. A small mass weighing some pounds, and now at Gotha.
5. Two masses in Greenland, out of which the knives of the Esquimaux were made.—See our last Number, p. 154, 155, and Ross's *Account of an Expedition to the Arctic Regions.*

SECT. II.—*Solid Masses where the Iron exists in Rhomboids or Octohedrons, composed of Strata, and containing Nickel.*

1. The only fall of iron of this kind, is that which took place at Agram in 1751.
2. A mass of the same kind has been found on the right bank of the Senegal.—*Compagnon, Forster, Golberry.*
3. At the Cape of Good Hope; Stromeyer has lately detected cobalt in this mass.—*Van Marum* and *Dankelman*; *Brande's Journal*, vol. vi. 162.
4. In different parts of Mexico.—*Sonneschmidt, Humboldt*, and the *Gazette de Mexico*, tom. i. and v.
5. In the province of Bahia in Brazil. It is seven feet long, four feet wide, and two feet thick, and its weight about 14,000 lb.—*Mornay* and *Wollaston*, *Phil. Trans.* 1816, p. 270, 281.

6. In the jurisdiction of San Jago del Estera.—*Rubin de Cœlis,* in the *Phil. Trans.* 1788, vol. lxxviii. p. 37.
7. At Elbogen in Bohemia.—*Gilbert's Annal.* xlii. and xliv.
8. Near Lenarto in Hungary.—*Ditto,* xlix.

The origin of the following masses seems to be uncertain, as they do not contain nickel, and have a different texture from the preceding:

1. A mass found near the Red River, and sent from New Orleans to New York.—*Journ. des Mines* 1812, *Bruce's Journ.*
2. A mass at Aix-la-Chapelle containing arsenic.—*Gilbert's Annal.* xlviii.
3. A mass found on the hill of Brianza in the Milanese.—*Chladni* in *Gilbert's Annal.* L. p. 275.
4. A mass found at Groskamdorf, and containing, according to Klaproth, a little lead and copper.

CHAP. III.—LIST OF FALLS OF DUST AND OTHER SUBSTANCES, EITHER OF A SOFT, DRY, OR HUMID NATURE.

P. C. 472, Nov. 5. or 6. A great fall of black dust, probably at Constantinople, during which the heavens seemed to burn. —*Procopius, Marcellinus, Theophanes, &c.*

652. A shower of red dust fell at Constantinople.—*Theophanes, Cedrenus.*

743. Dust fell in different places, accompanied with a meteor. —*Theophanes.*

Middle of the 9th century, red dust, and matter like coagulated blood, fell from the heavens.—*Kazwini, Elmazen.*

929. A fall of red sand took place at Bagdad.—*Quatremere.*

1056. Red snow fell in Armenia.—*Matth. Eretz.*

1110. A burning body fell in the Lake of Van in Armenia, and made its waters blood red. The earth was cleft in several places.—*Matth. Eretz.*

1416. Red rain fell in Bohemia.—*Spangenberg.*

In the same century, matter like coagulated blood, fell along with a stone at Lucerne.—*Cysat.*

1501. According to several chronicles, a shower of blood fell at several places.

1548, Nov. 6. A red substance like coagulated blood, fell with a meteor, probably in Thuringia.—*Spangenberg.*

1560. On the day of Pentecost, red rain fell at Embden and Louvaine.—*Fromond.*

—— Dec. 24. A meteor and red rain fell at Lillebonne.—*Natalis Comes.*

1586, Dec. 3. Red and black matter fell at Verde in Hanover, with thunder and lightning.—*MSS. of Salomon.*

1591. A shower of blood fell at Orleans.—*Lemaire.*

1618, Aug. A shower of blood, stones, and a meteor, fell in Styria.—*De Hammer.*

1637, Dec. 6. Much black dust fell in the Gulf of Volo and in Syria.—*Phil. Trans.* i. p. 377.

1638. Red rain fell at Tournay.

1640, Oct. 6. Red rain fell at Brussels.—*Kronland* and *Wendelinus.*

1645, Jan. 23. or 24. Red rain fell at Bois-le-duc.

1689. Red dust fell at Venice, &c.—*Valisnieri.*

1711, May 5. and 6. Red rain at Orsion in Sweden.—*Act. Lit. Sueciæ*, 1731.

1718, March 24. Gelatinous matter fell, with a globe of fire, in the Isle of Lethy in India.—*Barchewitz.*

1719. Sand fell in the Atlantic, latitude 45° N., and longitude 322° 45′ from Paris.—*Mem. Acad. Par.* 1719. *Hist.* p. 23.

1744. Red rain fell at St Pierre d'Arena near Genoa.—*Richard.*

1755, Oct. 20. Black dust fell in Shetland, particularly at Scalloway. It was like lamp black, and smelt strongly of sulphur.—*Phil. Trans.* vol. L. p. 297.

—— Nov. 13. The sky was red, and red rain fell in different countries.—*Nov. Act. Nat. Cur.* tom. ii.

1763, Oct. 9. Red rain fell at Cleves, Utrecht, &c.—*Mercurio Hist. y Polit.* Madrid, Oct. 1764.

1765, Nov. 14. Red rain fell in Picardy.—*Richard.*

1781, April 24. Count Gioeni observed, in the third region of Mount Ætna, every thing "to be wet with a coloured cretaceous grey rain," which, after evaporation, left every place covered with it to the height of two or three lines. All ironwork touched by it became rusty.—*Phil. Trans.* 1782, vol. lxxii. p. 1.

1796, March 8. A viscous matter fell along with a meteor in Lusatia. It had the colour and odour of dried brown varnish, and is supposed by Chladni to consist of sulphur and iron. *Gilbert's Annal.* lv.

1803, March 5. and 6. A shower of red snow or dust, fell at Pezzo, at the extremity of the Valle Camonica. It was preceded by a violent wind on the 5th. A similar shower fell in Carniola on the same days, and another shower of a rose colour fell over the whole surface of Carnia, Cadore, Belluno, and Feltri, to the height of five feet ten inches. White snow had previously fallen, and the red shower was again succeeded by white snow. The colouring matter consisted of silex, alumina, and oxide of iron.—*Opuscoli Scelti*, tom. xxiii., *Journ. de Physique*, Ap. 1804; and *Giornali di Fisica*, Nov. 9. Dec. 1818.

1813, March 13. and 14. Much red dust, red snow, and red rain, fell in Calabria, Tuscany, and Friuli, at the time of the fall of meteoric stones at Cutro. Snow and hail, of a yellow-red colour, fell over all Tuscany, with a north wind. Snow, of a brownish-yellow colour, fell at Bologna, the wind being south-west.—*Bibl. Brit.* Oct. 1813, and April 1814. According to Sementini, this dust contained,

Silex, - -	33	Chrome, - -	1
Alumina, -	15½	Carbon, -	9
Lime, - -	11¼	Loss, - -	15¾
Iron, -	14½		——
			100

1814, July 3. and 4. A great fall of black dust took place in Canada, with the appearance of fire.—*Phil. Mag.* xliv. 191.

—— Nov. 5. In the fall of meteoric stones in the Doab, each stone was found to be surrounded with a mass of dust.—*Phil. Mag.*

1815. About the end of September, the South Sea was covered with dust to a great extent.—*Phil. Mag.* July 1816, p. 73.

1816, April 15. Brick red snow fell on Tonal and other mountains in Italy. The earthy powder was composed of

Silex, -	8 grains.	Empyreumatic oil,	2
Iron, -	5	Carbon, -	2
Alumina, -	3	Watery ingredients,	2
Lime, -	1	Loss, - -	2.25
Carbonic acid,	0.05		——
Sulphur, -	0.25		26.

Art. II.—*On the Tides of the Mediterranean, and the occasional luminous appearances of its Waters.* By Henry Robertson, M. D. Member of the Literary Society of Athens, Physician Extraordinary to his Royal Highness the Duke of Kent, &c. Communicated by the Author.

WHILE at Venice, in the months of April and May 1817, I was very much surprised by perceiving the regular succession of tides in the Mediterranean, surrounding that city, as I was by no means prepared to expect this, either by previously conversing with travellers on subjects of inquiry regarding that sea, or by what had occurred to myself during a residence of several years on other parts of its coasts. It is a commonly received opinion, that there are no tides in the Mediterranean, an opinion which, with the exception above mentioned, I am not disposed to dispute; at the same time, from attentive observation, I am persuaded that the Mediterranean Sea does undergo a sensible elevation and depression of its waters; which regularly recur within the twenty-four hours, but which are by no means so remarkable, or perhaps so regular, as the ebb and flow even of the neap-tides in the ocean.

On the open shores of the Mediterranean, the highest elevation, and greatest depression appeared to me to be about two feet in calm weather *; it also appeared greater at periods corresponding to the spring-tides of the ocean, and was greatly increased on the blowing of the wind towards the coast. I have also observed a regular recurrence of the tides in that part of the Mediterranean surrounding Venice. Within its entrance at Malomocco, the tides are regular, an ebb and flow taking place every twelve hours, in which it appeared to me that the waters could not be less elevated than from eight to ten feet. This I estimated by seeing, that on the flow, boats easily floated over banks that at the ebb were dry, and elevated several feet above the water, and which I had an opportunity of remarking for the period of eighteen days, from the windows of the Lazaretto.

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* The Chevalier D'Angos observed a rise of *one foot* at Toulon three and a half hours after the Moon passed the meridian.—Ed.

That portion of the Adriatic in which the city of Venice is built, is separated from the rest of the Mediterranean by a narrow embankment of land, stretching from the Italian coast within the mouths of the Po, and joining a small peninsula opposite, not far from Treviso; through this embankment the openings to the Adriatic are shallow, narrow, and, with the exception of that by Malomocco, are extremely dangerous and difficult.

I apprehend there is a regularity of the tides in other parts of the Mediterranean, greater and more remarkable than what is observed to take place on the coasts of that sea, where it is open, and not intercepted by islands or headlands. Thus, Chateaubriand, in vol. i. p. 123 of his Travels, when speaking of his visit to the Pyræus, in the Gulf of Ægina, says, "M. Favel stopped in the curvature formed by a neck of land, to shew me a sepulchre excavated in the rock; it is now without roof, and is upon a level with the sea. By the regular flowing and ebbing of the tide, it is alternately covered and left exposed by turns, full and empty." During a transitory abode on the banks of the Lago di Guarda, I was fully persuaded that it is also subject to an elevation and depression of its waters, which seemed to me to recur regularly, and independently of the melting of the snows on the summits of the surrounding Alps, for I have seen the rise recur after sunset, and we know that all alpine rivers are fuller during the day, and in the summer, than when the sun is off the horizon, or in the winter.

In addition to these observations respecting the tides of the Mediterranean, I beg leave to offer what I have remarked respecting the very luminous appearance of its waters on the slightest agitation, so frequently perceived after sunset, especially during the warm season. By many people this has been supposed to be caused by certain minute luminous insects existing in the water *, to the disengagement of phosphorus from the excrements, or remains of fishes that have died, and other putrid matters. By seamen, this luminous appearance from the slightest agitation, has been considered as generally the precursor of blowing weather, and I am persuaded from repeated observation, that the remark is as correct as it is general. This

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* See our last Number, p. 217. Ed.

luminous appearance is but rarely met with during the winter season, compared to the frequency with which it occurs in the summer and autumn. I have never seen it when the wind blows fresh from a northerly point, or when the temperature of the air is low; nor have I remarked it in any great degree, but in calm weather, when the temperature of the air was high, and especially as the wind was changing towards a southerly point, and I have always observed that this luminous matter was emitted most strongly immediately preceding the fall of rain or an overcasting of the sky, shewing a disposition to the formation of that meteor. Upon the whole, I am of opinion, that this appearance of light on the agitation of the waters of the Mediterranean, is somehow or other connected with evaporation, and that it is occasioned by the rapid evolution of the electric fluid in that process; that probably it rarely depends on phosphoric matters existing in the waters; and after repeated and careful observations by myself and others, I have never been able to trace its appearance as depending on the existence of insects, nor could I ever perceive any thing peculiar in the sensible qualities of water taken up in such circumstances, or that was different from water of the sea when it did not give out this luminous appearance. Moreover, as this appearance is only perceived on the agitation of the water, it would therefore seem that the luminous matter, whatever it may be, does not depend on a matter that is merely blended or mixed in the water, as in such a state its appearance would be equally manifest in a calm, as when there is a gentle ripple on the surface; and it must have been equally discernible in all conditions of the weather; and what I consider as tending to corroborate my opinion, that the electric fluid is generally the cause of this shining appearance, an ingenious Greek physician informed me that he found it always extremely difficult to accumulate the electric fluid in his apparatus on such occasions. In support, however, of the opinion I entertain of the cause of the luminous appearance of the Mediterranean Sea, I may adduce the observations of M. Golbery on this question, as given in the second volume of his Voyage to the Coast of Africa. At the same time, I do not mean to deny that this appearance may be occasionally produced by other causes.

ISLE OF THANET, MARGATE, *March* 1. 1819.